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*MONTANA DEPARTMENT OF  
TRANSPORTATION*

## **ROAD DESIGN MANUAL**

### **Chapter Six**

## **SPECIFICATIONS/SPECIAL PROVISIONS/DETAILED DRAWINGS**



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## **Chapter Six**

# **SPECIFICATIONS/SPECIAL PROVISIONS/ DETAILED DRAWINGS**

Chapter Four presents the Department's procedures for the preparation of construction plans. In addition, contractors, material suppliers, and Department personnel assigned to supervise and inspect the construction of the project use the *Standard Specifications for Road and Bridge Construction* (Standard Specifications), Supplemental Specifications, Special Provisions and the *MDT Detailed Drawings* to assist them in the project design and construction. The *Montana Public Works Specifications* may also be utilized, particularly for urban projects and projects involving water lines and sanitary sewers. Chapter Six describes the purpose of these other documents. Chapter Six also presents the guidelines for preparing Special Provisions.

### **6.1 GENERAL**

#### **6.1.1 Hierarchy of Importance**

The *Standard Specifications*, Supplemental Specifications, *MDT Detailed Drawings*, Special Provisions and construction plans all are essential parts of the contract. They are intended to complement each other and are used to describe and provide complete instructions for the work to be accomplished. If a discrepancy does exist between these documents, the following presents the hierarchy of importance among them:

1. Special Provisions
2. Construction plans
3. Supplemental Specifications
4. *Standard Specifications*
5. *MDT Detailed Drawings*

#### **6.1.2 Specifications**

##### **6.1.2.1 *Standard Specifications for Road and Bridge Construction***

The *Standard Specifications for Road and Bridge Construction* (Standard Specifications) are standards adopted by the Department for work methods and

materials that are used for construction. The Standard Specifications are intended for general use on all projects. They provide the Department's criteria for:

1. bidding,
2. awarding of the contract,
3. the contractor's duties,
4. controlling the material quality,
5. the contractor and the Department's legal requirements,
6. executing the contract, and
7. measuring and paying for contract items.

The *Standard Specifications* are published in book form and are typically updated and reprinted every five to seven years. Copies of the Standard Specifications can be obtained from the Contract Plans Bureau.

A Standard Specification Revision Form must be submitted for all proposed changes to the *Standard Specifications* and addressed to the Construction Administration Services Bureau for evaluation and action.

#### **6.1.2.2 Supplemental Specifications**

Supplemental Specifications are additions, deletions and/or revisions to the *Standard Specifications* that have been adopted by the Department since the last printing of the *Standard Specifications*. The intention is that they will be incorporated into the *Standard Specifications* at the next revision. As indicated in Section 6.1.1, Supplemental Specifications supersede the *Standard Specifications*. Complete sets of Supplemental Specifications are added to the contract documents for all projects and are intended for general use.

Supplemental Specifications are typically updated and reprinted in their entirety every two months. Copies of the latest versions can be obtained from the MDT Internet Web page (Contractor's System) or Contract Plans Bureau.

A Standard Specification Revision Form must be submitted for all proposed changes to the Supplemental Specifications and addressed to the Construction Administrative Services Bureau for evaluation and action.

### **6.1.3 Special Provisions**

Special Provisions are additions or revisions to the Standard Specifications and the Supplemental Specifications setting forth conditions and requirements for a special situation on a particular project. Special Provisions are included in the contract documents for that project and are not intended for general use. Special Provisions supersede all other contract documents. The designer prepares them for inclusion into the project documents. The special provision should also include the appropriate Section number from the Standard Specifications (e.g. COLD MILLING [411]). Note that the section number is in brackets rather than parentheses. Section 6.2 discusses guidelines for preparing Special Provisions.

Standard Special Provisions are special provisions that are commonly applicable to many projects. The Contract Plans Section has compiled a list of standard special provisions for road and bridge items. This list is routinely updated and can be obtained from the Contract Plans Bureau. The designer is responsible for calling out the number and title of the standard special provisions that apply to road design items (e.g., No. 401-10 Fog Seal). Standard special provisions that require modification will have an “m” located after the date of initiation or revision. (e.g. 108-14 Sequence of Operations Revised 5-5-03 m). The designer should not send the text of the Standard Special Provision unless it contains revisions. The revisions should be highlighted. The designer must ensure that they are applicable for the particular project before their inclusion in the contract document.

### **6.1.4 MDT Detailed Drawings**

The *MDT Detailed Drawings* provide details on various design elements that are consistent from project to project (e.g., guardrail, fencing, drainage details). They provide information on how to layout or construct the various design elements. A copy of the *MDT Detailed Drawings* is provided to the contractor upon request.

Note that the first three numbers of the detailed drawing number are coordinated with the *Standard Specifications*. For example, Detailed Drawing #606-05 “Metal Guardrail” is referenced to Section 606 “Guardrail, Median Barrier Rail and Guide Post” in the *Standard Specifications*.

Hard copies of the *MDT Detailed Drawings* can be obtained from the Contract Plans Bureau. In addition, all drawings are provided on the Department's CADD system. Users can download and review the drawings on the MDT Intranet or MDT Internet Web page (Contractor's System). However, the designer will be unable to make changes to these files. The Contract Plans Bureau will provide updated hard copy versions on an

as-needed basis. All proposed changes to the *MDT Detailed Drawings* must be addressed to the Construction Administrative Services Bureau for evaluation and action.



## 6.2 SPECIAL PROVISION PREPARATION

Special provisions are required whenever a project contains work, material, sequence of operations, or any other requirements that are necessary for the completion of the project but are not “described completely” in the construction plans, *Standard Specifications*, Supplemental Specifications or the *MDT Detailed Drawings*. “Described completely” should be interpreted to mean that the prospective bidder will be able to clearly understand the work to be accomplished, type of materials or equipment required, construction methods or details to be used, how the item of work will be measured, and the basis of payment. The following sections provide guidelines for preparing special provisions.

### 6.2.1 Preparation Steps

Do not prepare special provisions using the “cut-and-paste” method. Instead, the designer should use the following steps when preparing a special provision:

1. Define Need. Review existing specifications, detailed drawings or construction plans to ensure that there is a need for the special provision. If the topic is not adequately covered in one of the other contract documents, only then should a special provision be prepared.
2. Research. Research the topic so that complete and detailed information is available before writing the special provision. This may require contacting manufacturers, contractors or suppliers for the latest information. Local conditions and problems should also be fully investigated.
3. Format. Prepare special provisions in the same manner as the *Standard Specifications*. Section 6.2.2 presents the format that should be used.
4. Type. Analyze the type of construction to be covered in the special provision to determine the type of special provision to be used. There are two basic types of special provision presentations — material or method presentation, and performance or end-result presentation. The material or method presentation describes the procedure or materials that should be used to construct the element. The performance presentation describes the end result of construction. The types of procedures and materials to achieve the end result are at the contractor's discretion. Only use one or the other form of presentation. The performance specification is preferred when applicable over the material or method specification.

5. Develop Outline. The outline should cover the basic requirements of the work to be completed or the materials to be used. It should define the essential physical characteristics of the material or work (e.g., dimensional limitations, time, strength, weight, size, shape, configuration). Organize all relevant factors under each appropriate heading.
6. Writing the Special Provision. Once the outline has been developed and all research has been completed, the first draft can then be prepared. The designer may want to review existing Special Provisions for guidance. The following presents several grammatical recommendations for preparing special provisions:
  - a. Wording. Write the special provision in the active voice (sentence begins with a verb) and the imperative mood (sentence expresses a command).  
  
Active Voice: "Apply rubbed finish to exposed surface."  
  
Passive Voice: "Rubbed finish shall be applied to exposed surface."
  - b. Sentences. Prepare the special provision using simple language and words. Keep words and sentences short (20 words or less), unless complexity is unavoidable.
  - c. Paragraphs. Limit paragraphs to 3-4 sentences.
  - d. Terminology. Words should be used consistent with the bid item and their exact meaning. Use the same word throughout; do not use synonyms. Avoid any words which have a dual meaning. Section 6.2.4 presents the recommended terminology that should be used. Omit extraneous words and phrases.
  - e. Will. The term "will" is reserved to describe actions to be performed by the Department.
  - f. Pronouns. Avoid the use of pronouns, even if this results in frequent repetition of nouns.
  - g. Punctuation. Carefully consider punctuation using the minimum number of punctuation marks consistent with the precise meaning of the language. Ensure that there can be no doubt on the meaning of any sentence.
  - h. Parentheses. Avoid the use of parentheses (). Instead, use commas or rewrite the sentence.

- i. Numbers. It is usually unnecessary to write numbers both in words and figures (e.g., “Use four (4) 1” (25 mm) bolts.”. Write numbers less than or equal to ten as words. Write numbers higher than ten numerically. When writing U.S. Customary dimensions, use fractions (e.g., ½ “, 1/8 “) and/or numerals (e.g., 0.20 ‘, 10.00 ‘, 1.7 gallons), for Metric (e.g., 5 mm, 3.0 m, 6.5 L). Do not write 2 “ x 4 “ (50 mm x 100 mm), but 2 “ by 4 “ (50 mm by 100 mm). Times and dates should be written numerically. Write fractions for metric as decimals. Decimals less than one should be preceded by the zero e.g., 0.02 ‘(e.g., 0.02 mm).
7. Reviewing. Review previously completed paragraphs as succeeding ones take shape. Where necessary, redraft preceding paragraphs to reflect later thoughts.

The designer should prepare and distribute the preliminary draft of the special provisions for review and comment at the Plan-in-Hand. The designer will be responsible for incorporating the reviewers' comments into the final draft. The final draft will also be distributed for comment at the final plan review.
8. The designer should coordinate with other units to ensure that special provisions are not duplicated (e.g., “Detour” or “Traffic Control and Sequence of Operations” written by both the Bridge Bureau and the Road Design Section). Where this occurs, combine the information into a single special provision that meets the needs of the project.
9. Presentation. Present special provisions as follows:
  - a. Type special provisions specific to a project in Word format. Store these files in the Document Management System and include them in submittal to Contract Plans Bureau.
  - b. Type standard special provisions that are modified in the Word format with the changes in bold type. When modifying a standard special provision, other than addition to active field information, delete the revision date from the title.
  - c. Identify standard special provisions that are used without modification by their title and number. Identify only those special provisions that apply to road design items.

### **6.2.2 Format**

Prepare special provisions in the active voice and in the same format as the *Standard Specifications*. The sections of the special provision that should be addressed include:

1. Description. Describe the work to be performed, with references to specifications, plans or other special provisions that further define the work. Where necessary or desirable for clarity, describe the relationship of this work item to other work items or other phases of construction.
2. Materials and/or Equipment. Designate the materials and/or equipment to be used in the work item and establish its requirements. Delineate complete specifications of the properties of each material and the method of tests. References may be made to AASHTO, ASTM or other recognized specifications.
3. Construction Details. Describe the sequence of construction operations or the desired end product. Do not mix the two types of presentations as described in Section 6.2.1. Where practical, use the performance presentation. This will permit the contractor to use improved equipment and new and advanced ideas in construction methods. Only use the presentation for the sequence of construction operations if it is critical to achieving the desired result. Specify quality control and quality assurance requirements, and specify who is responsible for testing.
4. Method of Measurement. Describe the components of the completed work item that will be measured for payment, the units of measurement and whether measured in original position, in transporting vehicles or in the completed work. Designate any modifying factors and other requirements needed to establish a definite, measured unit (e.g., disturbed or undisturbed, temperature, waste, etc.).
5. Basis of Payment. Describe the units for which payment will be made, and define the scope of work covered by such payment. Ensure consistency with the bid items.

### **6.2.3 Guidelines**

In addition to Sections 6.2.1 and 6.2.2, the following presents several guidelines the designer should consider when developing special provisions:

1. Completeness. When developing the special provision, ensure that the essentials have been included and that each requirement is definitive and complete. The special provision should not be vague.

2. Clarity. To ensure the special provision is clearly presented, review the following:
  - a. Clearly delineate the method of measurement and payment.
  - b. Make a clear, concise analysis of the job requirements for general conditions, types of construction and quality of workmanship. Do not leave the bidder in doubt, as the contractor, on what will be required.
  - c. Give directions, never suggestions.
  - d. Never assume the engineer or contractor “knows” what is meant.
  - e. Do not use phrases such as “as approved by the engineer,” “at the discretion of the engineer,” or “as directed by the engineer” in place of definite workmanship requirements. Such phrases may lead to confusion or misunderstanding. The contractor may not know what the engineer is thinking.
  - f. Avoid conflicting or ambiguous requirements. Every specification should have only one meaning.
  - g. Never conceal difficulties or hazards from the contractor.
3. Conciseness. Write each special provision as concise as practical. When reviewing the special provision, consider the following suggestions:
  - a. Avoid duplications between the special provision and any related contract documents.
  - b. Do not give reasons for a specification requirement.
  - c. Do not provide additional information that is unnecessary for the preparation of bids and the accomplishment of the work.
  - d. Once stated, do not repeat any instruction, requirement, direction or information given elsewhere in the contract documents.
  - e. Do not include mandatory provisions that are required in general by the contract.
  - f. Minimize the use of cross references.
  - g. Write the specification in the positive form.

4. Correctness. To ensure that the special provision is written correctly, review the following:
- a. Where practical, independently crosscheck every factual statement.
  - b. Do not include items that cannot be required or enforced.
  - c. Ensure that the specification does not punish the contractor or supplier.
  - d. Ensure that the specification does not unintentionally exclude an acceptable product, construction method or any equipment. If suppliers/products are specified in the provision provide at least 3 suppliers/products. Listing one supplier/product and adding "or approved equal" is not acceptable
  - e. Ensure that the provision does not change the basic design of the item.
  - f. Do not specify impossibilities. The practical limits of workmen and materials must be known and recognized.
  - g. Specify standard sizes and patterns wherever practical.
  - h. Avoid personal whims and pet requirements.
  - i. Ensure that the contractor will not be held responsible for the possible inaccuracy of information furnished by the Department.
  - j. Ensure that sufficient attention has been provided to assessing the durability or reliability of the material or procedure discussed. The use of permanent and recognized standards should be quoted to ensure that the specified performance or characteristics are achieved. If not, the testing criteria should be completely and accurately defined.
  - k. Make a careful, critical examination of manufacturers' or trade associations' recommendations, and require supporting evidence before adopting them.
  - l. Keep requirements stringent. A strong requirement can be relaxed more economically, when the need arises. Weak specifications cannot be strengthened without increasing cost and generating claims.
  - m. Ensure that the provision gives directions that are consistent with the standard practice currently used by the Department.

#### 6.2.4 **Terminology**

1. Abbreviations. Generally, avoid abbreviations. However, they may be used if they are defined and the definitions are consistent with the accepted meanings.
2. Amount, quantity. Use “amount” when writing about money only. When writing about measures of volume, such as m<sup>3</sup>, liters, etc., use “quantity.”
3. And/or. Avoid using “and/or”; instead, use “and” alone, or “or” alone, or “or ... or both.” For example, “Unless otherwise specified by the plans or special provisions or both,...”.
4. Any, all. The word “any” implies a choice and may cause confusion. Use the term “all” in place of “any.” For example, “Make good all defects.”
5. As per. Do not use “as per”; instead, use “as stated,” “as shown,” “conforming to,” or other similar phrases.
6. At the contractor's expense. Do not use the phrase “at the contractor's expense”; instead use, “at no cost to the Department” or “absorbed in the cost of other contract items.”
7. Balance, remainder. Use the term “balance” when referring to money. Use “remainder” to describe something or material left over.
8. Coarse, course. Use “coarse” to describe textures and “course” for layers.
9. Conform. Use the word “conform” to refer to dimensions, sizes and fits that must be strictly adhered to (e.g., “cut bolt threads conforming to ASA Standards, Class 2 fit, coarse thread series”). Where a better product is acceptable, use the phrase “meeting the requirements of...” (e.g., aggregates meeting the specification requirements when tested in accordance with AASHTO T27.)
10. Contractor. Use the word “contractor” in place of the word “bidder” when writing special provisions for construction. Only use “bidder” for proposals.
11. Or equivalent. Use this phrase for only minor parts. The contractor may not know what is truly equivalent before awarded the contract. It is better to clearly specify those things that will be accepted as “equivalent.”
12. Proposal. Do not use the word “proposal” when the word “contract” is intended. Only use “proposal” to describe requirements during the bidding process.

13. Resisting, resistant. Do not use “corrosion-resisting,” but instead use, “corrosion-resistant.”
14. Said. Do not use “said pipe,” “said aggregates” but instead, use “this pipe,” “these aggregates.”
15. Same. Do not use “same” to replace a pronoun like “it” or “them” standing alone, such as “connected to same,” “specified for same,” “same will be given consideration,” “conforming to requirements for same.” Rewrite the sentence to clearly describe what is meant.
16. Shall, will. Do not use “shall.” Use “will” to describe actions performed by the Department.
17. Such. Do not end a sentence with the word “such.” “Such” usually means “of this or that kind,” or similar to something stated. Instead, state that which is actually meant, or name the work to be completed or rephrase the sentence.
18. Symbols. Do not use the following symbols when writing special provisions:

<u>Symbol</u>	<u>Write Instead</u>
/	per, or “a”
X <sup>o</sup>	°F or degree Fahrenheit
%	percent
+	plus
-	minus
x	by

19. The. Do not eliminate “the” for brevity.
20. Thoroughly. Avoid using the adverb “thoroughly,” as in thoroughly wet, thoroughly dry, thoroughly clean, etc., as it is unenforceable. Preferably, state the value of the intended requirements in percent, dimensions, number of passes, etc.